the butterfly mind of to-day differs in some respects from the mental traits of primeval butterflies, which had a different environment, different food plants and different enemies, and which must have practiced different arts and stratagems in their struggles for life from those of their descendants?

NEWTON AND JENNEY'S GEOLOGY OF THE BLACK HILLS OF DAKOTA.[1]—This posthumous volume is a worthy monument to the memory of Mr. Newton, a young and promising geologist, who died before completing the main portion of the report, including the first three chapters. Chapter IV on the mineral resources, and V on the climate and resources, are by Mr. Jenney; these were, by resolution of the U. S. Senate, called for in advance of the final report, and with a preliminary map were published in the spring of 1876; the field work occupying the four summer and early autumn months of 1875. It will be remembered that Gen. Custer's famous reconnoisance was made in the summer of 1874.

The Black Hills were first geologically explored by Dr. F. V. Hayden, who made a rapid examination of the geology of the foothills and extremities of the region during the exploration of Lieut. (now Gen.) G. K. Warren, in 1857. Dr. Hayden remarked as the result of his observations, that the Black Hills of Dakota would form one of the most interesting studies on this continent, and that in all the western country he had never seen the Cretaceous, Jurassic, Triassic or red-bed, the Carboniferous and Potsdam rocks so well exposed for study as around the Black Hills, and he spoke of the desirability of a careful detailed topographical and geological survey of this range. The gold discovered under Custer, led the Government to order a geological survey of this region, and the results are placed before the people in this elaborate and valuable report.

Mr. Newton thus speaks of this isolated group of mountains: "Elevated as they are like an island above the surrounding sea of the plains, and separated by more than one hundred miles from the nearest spur or sub-range of the Rocky mountains, the Black Hills are a complete study in themselves. Exhibiting in the strata exposed, and in the general character of the elevation, most of the principal features of the geology of the Rocky mountains, they are a geological epitome of the neighboring portions of that great range. The geologist, therefore, finds in this region a monographic study of universal interest, and by the regularity of the uplift, by the absence of great faults in the strata, and by the splendid exposures of the sedimentary rocks, he is given a piece of mountain geology of great beauty, simplicity and ease of elucidation.

"Usually in explorations in the West or elsewhere, the field of

[1] *Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region.* J. W. POWELL in charge. Report on the Geology and Resources of the Black Hills of Dakota, with atlas. By HENRY NEWTON, E.M., and WALTER P. JENNEY, E.M. Washington, 1880. 4to, pp. 566.

work of the geologist at any one time or season is but a part, and commonly a very small part, of a great system that extends over vast areas of country. Thus, in explorations in the Rocky mountains, the most assiduous labor of the geologist can cover thoroughly, in one season, but a small part of the great range, and his discussion of results cannot be complete in itself, but must depend largely upon work in the adjoining regions. Rarely then, does the geologist find his work so admirably circumscribed by nature as did those to whom the exploration of the Black Hills was committed. * * * Generally and simply the geological structure of the Black Hills is as follows: Around a nucleal area of metamorphic slates and chists, containing masses of granite, the various members of the sedimentary series of rocks, the Potsdam, Carboniferous, Trias or red-beds, Jura, Cretaceous and Tertiary, lie in rudely concentric belts or zones of varying width, dipping on all sides away from the elevatory axis or region of the Hills. From the Hills outward the inclination of the beds gradually diminishes until all evidence of the elevation is lost in the usual rolling configuration of the plains. At numerous points, also, within the area of the Hills, are centers of volcanic eruption of an age probably coincident with that of the elevation of the mountains themselves."

The chapters by Mr. Newton, who died of typhoid fever at Deadwood, in 1877, were revised and prepared for the press by Mr. G. K. Gilbert, while the report is preceded by an appreciative biographical sketch prepared by Professor J. S. Newberry.

The palæontology of the report, accompanied by sixteen elaborate plates of fossils, is by Mr. R. P. Whitfield; an essay on the microscopic petrography of the Black Hills, with two fine colored plates, is by John H. Caswell; while Professor Asa Gray offers a brief enumeration of the plants, and Mr. Horace P. Tuttle reports upon the astronomy and barometric hypsometry of the Black Hills.

A MEMOIR ON THE LOXOLOPHODON AND UINTATHERIUM, by Henry F. Osborn, Sc.D.[1]—This fine memoir opens auspiciously the quarto series of Contributions from the E. M. Museum of Geology and Archæology of the College of New Jersey. The fine series of specimens of *Dinocerata* obtained by the Princeton Scientific Exploring Expedition are here described and partly figured. A third species of *Loxolophodon* is described under the name of *L. speirianum*, which, judging from the figures given, was not less extraordinary than the other species of the genus. A good deal of light is thrown on the structure of these animals, especially as to the characters of the lower jaw. A note from Professor Guyot introduces the publication series, and a sketch of the Bridger beds of the Washakie basin closes the book.

[1] *A Memoir upon Loxolophodon and Uintatherium.* By HENRY F. OSBORN, Sc.D. Accompanied by a Stratigraphical Report on the Bridger beds in the Washakie basin. By JOHN BACH MCMASTER, C.E. 4to, pp. 54, IV plates, II maps. Published by the Museum, Princeton, 1881.